International Council for the
Exploration of the Sea

C.M.1979/H:1
Administrative Report

PELAGIC FISH COMMITTEE

by

J. Jakobsson

1978

Belgium

(R. De Clerck)

Herring and sprat

No marked sampling pelagic fish had been carried out in 1978. Research vessel surveys on the two juvenile species were continued as given in the table below.

Research vessel surveys.

Area	Season	Objective
Belgian coast	Whole year, monthly intervals	Recording densities of immature herring and sprat.

Canada

(T.D. Iles & G. Winters)

All research relevant to this committee has been reported to ICNAF.

Danmark

(K. Popp Madsen)

The RV "Jens Chr. Svabo" participated in the International Young Herring Surveys in Februar-March 1978.

Herring. Denmark 1978

Area	Season	Type of fish	No of samples		No of fish		
			Research vessel	Market	Measured	Aged	Examined racially
NW North Sea (03)	1	Mixed		11	38	38	-
	3	"		4	10	10	-
	4	"		4	4	4	-
NE North Sea (04)	1	Mixed		2	2	2	-
Central North Sea (09)	1	Mixed		15	242	242	
	2	"		4	107	107	
	3	"		15	120	120	
	4	"		35	383	383	
Skagerrak (05)	1	Mixed		1	19	19	
	2	"		7	120	120	100
	3	"		62	1333	989	358
	4			62	468	468	105
Kattegat	1	Mixed		10	822	822	185
	2	"		24	1967	1967	1362
	3	"		46	3086	1825	203
	4	"		37	1761	1481	343
Baltic	1	Mixed		4	1706	1706	40
	2	"		6	1486	1486	
	3	"		5	1155	1155	
	4	"		6	1967	1967	

Sprat. Denmark 1978.

Area	Season	Type of fish	No of samples		No of fish		
			Research vessel	Market	Measured	Aged	Examined racially
NW North Sea (03)	4	Mixed		1	89	89	-
Central North Sea (09)	1	Mixed		32	3949	3949	-
	2	"		30	283	283	-
	3	"		34	1800	1800	-
	4	"		63	5283	5283	-
Skagerrak (05)	1	Mixed		1	299	299	-
	2	"		13	858	858	-
	3	"		65	2436	2436	-
	4	"		66	2483	2483	-
Kattegat	1	Mixed		10	2014	2014	-
	2	"		20	1832	1832	-
	3	"		45	2558	2558	-
	4	"		37	2605	2605	-
Baltic	1	Mixed		3	486	486	-
	2	"		5	443	443	-
	3	"		3	517	233	-
	4	"		6	565	565	-

Finland

(V. Sjöblom - R. Parmanne)

No work done on pelagic fish other than that reported to the Baltic Fish Committee.

France

(G. KURC)

Ce rapport regroupe les activités des trois organismes qui conduisent des programmes de recherches sur les poissons pélagiques, à savoir, l'Institut scientifique et technique des Pêches maritimes (ISTPM), le Centre national pour l Exploitation des Océans (CNEXO-COB) et l'Office de la recherche scientifique et technique Outre-Mer (ORSTOM).

En ce qui concerne sardines, anchois, sprats, harengs, maquereaux et merlans bleus, les travaux sont menés par l'ISTPM. Les thons de l'Atlantique NE sont étudiés par l'ISTPM sur le plan de la biologie et de la pêche et par le CNEXO-COB pour ce qui concerne l'évaluation des stocks.

1. EAUX TEMPEREES.

1.0. Petits pélagiques.

Après deux années d'étude de la répartition des différentes espèces pélagiques côtières du golfe de Gascogne (sardines, anchois, sprats), l'Institut scientifique et technique des Pêches maritimes a mis en oeuvre en 1978 un programme d'évaluation des différents stocks par écho-intégration.

La méthodologie générale de cette nouvelle technique a été mise au point au cours d'une campagne à la mer, mais il s'avère qu'un important travail concernant l'étalonnage, les réponses acoustiques des différentes espèces et l'identification des détections reste à effectuer.

L'échantillonnage réalisé au cours de cette unique campagne avait pour but de permettre une étude de la répartition et de la structure démographique des différents stocks.

Sardine.

La production sardinière a été de l'ordre de 5 700 tonnes dans le secteur VIIIa et de 400 tonnes dans le secteur VIII b.

Cette augmentation de près de 1 500 tonnes de la production de sardine atlantique par rapport à 1977 a essentiellement pour origine un développement de la pêche au chalut pélagique dans le secteur de La Turballe en particulier.

Espèce	Région	Période	Nombre d'échantillons		Nombre de poissons		
			navire de recherche	marché	mesurés	âgés	numération vertébrale
Sardine	VIIIa	mars avril	2	-	147	-	-
	VIIIb	mars avril	5	-	641	-	-
			7		788		

Anchois.

Les apports d'anchois dans le secteur VIIa peuvent être estimés à environ 1 000 tonnes alors qu'ils atteignent 1 800 tonnes dans le secteur VIIIb. Ces captures dépassent les capacités d'absorption du marché de la transformation, et sont limitées par l'absence d'un marché en vert.

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Espèce	Région	Période	Nombre d'échantillons		Nombre de poissons		
			navire de recherche	marché	mesurés	âgés	numération verté-brale
Anchois	VIIIa	MARS Avril	8	-	1 281	-	-
	VIIIb	Mars Avril	8	-	2 069		
			16		3 350		

Sprat.

Malgré des perspectives intéressantes de captures dans le secteur VIIIa, cette espèce n'est toujours pas exploitée par suite de l'absence de marché.

Espèce	Région	Période	Nombre d'échantillons		Nombre de poissons		
			navire de re-cherche	marché	mesurés	âgés	numération vertébrale
Sprat	VIIIa	Mars Avril	6		694		
	VIIIb	Mars Avril	3		271		
			9		965		

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Hareng.

Echantillonnage Mer du Nord

Saison	Région	genre de poisson	Nombre d'échantillons		Nombre de poissons	
			recherche	marché	mesurés	âgés
1er trimestre	09-12 (Mer du Nord)	juvéniles	11			550
2ème "	03 (NW Mer du Nord)	adultes	2		184	
3ème "	12 (sud Mer du Nord)	juvéniles		1	331	80
4ème "	02	adultes		3	635	151
	03	"		2	325	41
	09	"		1	236	38
	12	"		9	1 326	121

Activités du navire de recherches.

n/o "Thalassa" international Young Herring Survey (Mer du Nord) du 4 au 23 février 1978.

Echantillonnage golfe de Gascogne

La faiblesse de la production de cette pêche accessoire (200 t) semble tenir à des problèmes d'accessibilité pour cette espèce très côtière dont le stock est de toute façon peu important.

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Espèce	Région	Période	Nombre d'échantillons prélevés		Nombre de poissons		
			navires de recherche	marché	mesurés	âgés	numération vertébrale
hareng	VIIIa	août	-	1	80	80	80

Maquereau.

Echantillonnage (Boulogne/Mer)

Saison	Région	Nombre d'échantillons prélevés		Nombre de poissons	
		navire de recherche	marché	mesurés	âgés
3ème trimestre	VIId		11	1 455	
4ème trimestre	VIId		3	402	
	VIIe		2	444	
	VI a		1	67	

Echantillonnage (Lorient)

saison	région	Nb d'échantillons recherché	Nb d'échantillons marché	Nb poissons mesurés	Nb d'otolithes prélevés	Nb d'otolithes lus
1er trim	VII b		1	199		
	VII e		4	1 886	65	65
	VII f		4	1 128	108	108
	VII j		1	320		
	VII h		3	486		
2ème trim	VI a		3	650		
	VII a		1	218		
	VII b		1	333		
	VII e		2	739	42	42
	VII f		1	128	113	113
	VII h		5	907	115	115
	VIII a		1	217		
3ème trim	VII a		1	179		
	VII f		1	213	100	
	VII g		3	356	36	
	VIII a		6	891	31	
4ème trim	VI a		1	83		
	VII e		3	494		
	VII f		2	515	64	
	VII g		4	839	70	
	VIII a		1	69	24	

Aucun travail particulier n'a été effectué sur cette espèce en dehors de l'échantillonnage en criée et de la détermination de la structure démographique des apports -

Merlan bleu

Echantillonnage (Boulogne/Mer)

Région	Nombre d'échantillons	Nombre de poissons mesurés	Nombre de poissons âgés
est Islande	8	2 824	239
Rosengarten	2	882	201
Faéroé	6	667	195

Activités du navire de recherche.

n/o "Thalassa du 29 juin au 28 juillet 1978.

1.1. Thonidés.

Germon (Thunnus alalunga)

Au cours de l'année 1978, deux campagnes thonières axées essentiellement sur l'espèce T. alalunga ont été effectuées entre la péninsule ibérique, l'archipel des Açores et le large des côtes de la Bretagne jusqu'aux 20°W environ. Ces deux campagnes ont représenté quarante jours de mer au cours desquels 471 germons ont été capturés, dont 214 marqués ; par ailleurs, 54 T. obesus ont été pris et 28 marqués. Une troisième campagne effectuée dans le nord ouest Atlantique au sud et à l'est du Grand Banc de Terre Neuve a permis la capture de 3 germons (marqués) et de 212 listaos (K.pelamis).

Echantillonnage I.S.T.P.M.

Espèce	Région	Saison	Stade	Nombre mesuré sur Btx de recherche
T. alalunga	Côtes Europe 25 Ouest	2ème et 3ème trimestres	immatures	471

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Echantillonnage C.N.E.X.O.

Espèce	Région CIEM	Saison	Lieu	Nombre
T. alalunga	VII j	3ème trimest.	Port de débarquement	2 970
	VII k	"	"	
	VIII	"	"	
	IX b	"	"	
	X	"	"	
	XII	"	"	

Pas de marquage effectué.

Traitement de 380 fiches de pêche remplies par les Capitaines permet de cartographier la répartition des lieux de pêche. De plus, les Capitaines classent directement les germons par classe de taille qui sont aussi des classes d'âge. Ceci représente donc 598 000 germons âgés directement.

Thon rouge

Echantillonnage C.N.E.X.O.

Région	Saison	Lieu	Nbre mesuré
VIII	3ème trim.	débarquement	114

42 fiches de pêche ont été traitées.

De plus, avec la coopération des patrons et des mareyeurs, 14 000 thons sont âgés directement en se basant sur les tris par classe de tailles commerciales.

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Travaux de recherches.

En utilisant les données des pêcheries ainsi recueillies, le CNEXO-COB procède à l'évaluation régulière de l'état des stocks de germons et de thons rouges intéressant les pêches françaises en Atlantique. Ces évaluations sont soumises sous forme de documents de travail à la session annuelle de l'ICCAT.

2. EAUX TROPICALES.

2.0. Petits pélagiques.

La production de la pêche sardinière à Pointe Noire était en 1978 de 4 472 t. Elle était essentiellement composée de sardinelles (88 %).

Le stock de sardinelles est toujours sous-exploité. Le développement de cette pêche étant limité en grande partie par l'état de saturation du marché. Pour ces espèces aussi, les études biologiques et dynamiques sont très avancées, et en voie de publication, et, sur le terrain ne se poursuivent plus que les relevés nécessaires à l'étude du recrutement (mensurations et pesées de gonades).

Congo - Pointe Noire

Espèces	Nombre d'individus mesurés				
	1er trim.	2ème trim.	3ème trim.	4ème trim.	totaux
S. aurita	188 (9)	394 (13)	1 023(15)	1 379 (12)	2 984 (49)
S. maderensis	1768 (9)	969 (13)	687(15)	2 583 (12)	6 007 (49)

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Côte d'Ivoire (Abidjan)

Espèce	Nombre échantillons	Nombre mesurés	Biologie			
			condition	sexe	maturité	Pd gonades
S. eba	103	9 983	+	+	+	+
S. aurita	69	5 730	+	+	+	+
Ilisha africana	13	1 376	+	+	+	+
D. auritus	61	6 923	+	+	+	+
T. lepturus	17	1 355	+	+	+	+
B. capiscus	47	4 195	+	+	+	+
L. glauca	8	652	+	+	+	+
Chloroscombrus chrysurus	14	1740	+	+	+	+
Autres carangidae	27	2 140	+	+	+	+
Ponsadasys jubelini	20	1 136	+	+	+	+
Divers	28	1 686				
Total	407	36 916				

2.1. Thons.

Du 6 octobre au 20 novembre, une mission exploratoire du n/o "Thalassa" a couvert tout un secteur dans le sud ouest et le sud de l'archipel açorien.

D'autre part, au cours de sa mission consacrée à la recherche du germon dans les parages des Açores ou dans l'Atlantique NW, les navires de l'ISTPM ont capturé du listao (K. pelamis) et du patudo (T. obesus).

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Echantillonnage ISTPM

Espèce	Région	Saison	Stade	Nbre mesuré
T. obesus	nord et est Açores	2e-3e trim.	immature	54
K. pelamis	sud et est Grand Banc Terre Neuve	3e-4e trim.	immature	212

Côte d'Ivoire (Abidjan)

Mois	Albacore T.albacares	Listao K. pelamis	Patudo T. obesus	Germon T.alalunga	Total
Janvier	1 471	471	227		2 169
Février	2 003	544	215		2 762
Mars	1 720	587	122		2 429
Avril	1 187	274	133		1 594
Mai	1 000	356	133		1 489
Juin	1 798	1 218	607		3 623
Juillet	1 756	717	688	2	3 163
Août	1 024	427	237		1 688
Septembre	1 609	757	322	30	2 718
Octobre	916	558	192	11	1 677
Novembre	1 154	107	90		1 351
Décembre	1 013	426	84		1 528
Total	16 651	6 442	3 050	43	26 186

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Rapport sur la recherche halieutique au Sénégal en 1978.

Etude de la pêche pélagique

Les études des poissons pélagiques par le CRODT comprennent deux volets:

- études des poissons pélagiques hauturiers.
- études des poissons pélagiques cotiers.

Elles portent sur la biologie appliquée et sur la dynamique des populations.

1) Etude des poissons pélagiques hauturiers.

La pêche des thonidés étant internationale, les études du CRODT entre dans le cadre du programme général de l'ICCAT.

1.1. Listao Le CRODT a été plus particulièrement chargé de l'étude de la biologie du listao. En 1978, 1182 poissons ont été examinés et l'on a relevé les renseignements suivants: longueur fourche, poids total, poids des gonades. Sur environ 1100 individus l'épine dorsale a été prélevée en vue d'étudier la croissance, 40 de ces épines ont été coupées a 400 microns pour examen. Les études de fécondité ont porté sur 335 gonades sur lesquelles 20000 á 25000 ovocytes ont été mesurés.

1.2. Ensemble des thonidés

1.2.1. Etude des débarquements

Les débarquements et transbordements de thons à Dakar sont relevés régulierement. Les résultats pour 1978 sont les suivants (en tonnes):

	Albacore	Listao	Patudo	Total
Débarquements	4.250	6.250	2.900	13.400
Transbordements	11.300	6.850	400	18.550
TOTAL	15.550	13.100	3.300	31.950

Le nombre d'échantillons prélevés pour mensuration a éte le suivant:

	Albacore	Listao	Patudo	Total
Nombre d'échantillons	184	183	67	434
Nombre approximatif d'individus	9.200	9.300	3.400	21.900

1.2.2. Campagnes de recherche en mer.

Une campagne de marquage a été effectuée du 12 au 17 juin 1978 avec le N/O LAURENT AMARO. Elle a permis de marquer 1.094 individus.

Albacore	Listao	Patudo	Total
136	121	837	1.094

2) Etude des poissons pélagiques côtiers.

Les études portent sur les stocks sénégalo-mauritaniens de Sardinelles (S. aurita et S. maderensis) de chinchards (Caranx rhonchus, Trachurus spp.), de maquereaux (Scomber japonicus) ainsi que sur d'autres espèces d'importance secondaire. Au Sénégal ces espèces sont débarquées par la pêche sardinière des senneurs dakarois et par les pêches artisanales tout au long de la côte. Les flottes étrangères ne débarquent pas leur produit au Sénégal.

2.1. Etude des débarquements.

Les statistiques de pêche sont tenues à jour pour les pêches industrielles et artisanales au filet. Les données pour 1978 sont partiellement dépouillées. Les résultats sont les suivants:

Pêche sardinière dakaroise	S.aurita	S.maderensis	Chinchards	Divers	Total
	12.660	5.310	2.080	860	20.910

Pêches artisanales: total estimé: 70.000 tonnes dont environ 50.000 tonnes de sardinelles.

Des échantillons sont prélevés pour mensuration, en 1978 ils se répartissent comme suit pour les espèces principales:

Espèces	Sardiniers dakarois		Peches artisanales au filet		TOTAL	
	Echantillons	Individus	Echantillons	Individus	Echantillons	Individus
S.aurita	163	23.541	117	7.059	280	30.600
S.maderenris	112	16.728	142	6.134	254	22.862
C.rhonchus	46	4.953	22	1.232	68	6.185
T.trecae	14	503	0	0	14	503
T.trachurus	1	5	0	0	1	5
Pomadasys sp.	16	2.971	28	1.880	44	4.851
ChloroscombrusO.	5	688	9	453	14	1.141
Scomber J.	9	65	1	7	10	72
TOTAL	366	49.454	319	16.765	685	66.21

Pour des raisons pratiques les données concernant les espèces pélagiques capturées à la ligne (tassergal et chinchard jaune) sont présentées aves les peches démersales.

2.2. Etudes biologiques.

Des échantillons sont prélevés pour les études de variation du rapport gonado-somatique pour les sardinelles et les chinchards. Les prélèvements ont été les suivants:

	S.aurita	S.maderensis	C.rhonchus
Nombre d´échantillons	32	29	12
Nombre d´individus	658	606	255

Pour certains échantillons des prélèvements d´écailles (Sardinelles) ou d´otolithes (chinchard jaune) ont été effectué en vue d´étudier la croissance:

	S.aurita	S. maderensis	C.rhonchus
Nombre d´échantillons	24	17	7
Nombre d´individus	742	564	214

2.3. Campagne de recherche en mer.

Contrairement aux autres années, aucune campagne d´échointégration n´a eu lieu en 1978 en raison de l´indisponibilité du N/O CAPRICORNE aux dates voulues.

Cinq campagnes de collecte d´ichtyoplancton ont eu lieu en mai, juin, août et septembre 1978 avec le N/O LAURENT AMARO en vue de l´étude des larves de S. aurita.

Une campagne de prospection des pélagiques côtiers a eu lieu en juillet 1978 avec le N/O LAURENT AMARO et la collaboration d´un bateau de pêche polonais, le KANTAR.

German Democratic Republic
(H. Schultz)

BLUE WHITING

SAMPLING

Area	Season	Type of fish	No. of Samples			No. of fish measured	No. of fish aged	No. of fish examined racially
			Research-vessel	Commercial vessel	Market			
IIa (Eastern Norw. Sea)	III	Adults	6	-	-	1152	219	50[2]
IIa (Central Norw. Sea)	III	Adults	7	-	-	1364	495	195[1] + [illegible][2]
IIa (Kopytov)	III	Adults	4	-	-	1296	395	195[1] +200[2]
IIa (Faroe)	II	Adults	7	-	-	2234	510	110[1]
IIa (Jan Mayen)	III	Adults	-	14	-	1400	-	-
IIb (S-Spitsbergen Bear Island)	III	Adults	14	-	-	304o	641	50[2]
Vb_1 (Faroe)	II	Adults	7	-	-	2442	500	98[1]
	II	Adults	-	-	1	173	100	100[1]
	III	Adults	-	-	2	409	200	99[1]
IVa (Norw.Deep) (at 60°N)	III	Immat.	1	-	-	333	50	-
IV a (Norw-Deep at 58°N)	III	Immat., Adults	1	-	-	443	98	-
IIIa (Norw.Deep at 7°E)	III	Adults., Immat.	1	-	-	366	100	50[2]

1) Vertebrae
2) Biochemical analysis

RESEARCH VESSEL SURVEY

Area	Date	Objectives
Faroe	7.-20.5.	Stock distribution and composition, trawling, egg and larvae occurrence, hydrography
Norwegian Sea Spitsbergen-Kopytov Norwegian Deep	8.-13.7., 4.-12.8.) 14.7.-3.8.) 5.-7.7., 13.-15.8.)	Stock distribution and composition, trawling, hydrography

OTHER RESEARCH ACTIVITIES: A total of 290 fishes of the Norwegian Sea, the area S-Spitsbergen and Kopytov were sampled for water content analysis. In 3 samples (250 specimen) of the Norwegian Sea and the Kopytov area parasitological studies were performed.

CAPELIN

SAMPLING

Area	Season	Type of fish	No. of Samples		No. of fish measured	No. of fish aged	No. of fish examined racially
			Research	Market			
IIb (S-Spitsbergen-Bear-Island)	III	Immat., Adults	5	-	936	200	-
IIa (Bear-Island Kopytov)	III	Immat., Adults	2	-	713	50	-
IIa (NW of Jan Mayen)	III		-	1	211	100	-

POLAR COD

SAMPLING

Area	Season	Type of fish	No. of Samples		No. of fish measured	No. of fish aged	No. of fish examined racially
			Research	Market			
IIb (S-Spitsbergen Bear-Island)	III	Juveniles	2	-	196	-	-
MACKEREL							
IIa (Norwegian Sea)	III	Adults	7	-	155	53	-
SARDINE							
CECAF 34.3.1	IV	Adults	3	-	877	120	-
HORSE MACKEREL (Trachurus trachurus)							
CECAF 34.3.1.	IV	Adults., Immat.	10	-	2461	355	-
SCAD (Decapterus rhonchus)							
CECAF 34.3.1.	IV	Adults	3	-	361	100	-
CHUB MACKEREL							
CECAF 34.3.1.	IV	Adults, Immat.	5	-	1150	155	-
ROUND SARDINELLA							
	IV	Adults	2	-	377	120	-

Germany, Federal Republic of

(D.Sahrhage)

Sampling Herring

Area	Season	Type of Fish	Number of Samples		Number of Fish		
			Research Vessel	Market	Measured	Aged	Examined racially
NW-North Sea 03	I	1, 2, 8	3	-	639	253	100
	III	3,4,5,6,7	6	-	906	78	78
South Buchan 08	III	1,2,3,4,8	1	-	266	85	85
Central North Sea 09	I	1,2,3,4,5	31	-	5463	702	-
	II	1, 2	1	-	119	59	-
	III	1,2,3,4,5	13	-	982	414	414
	IV	2,5,8	1	-	91	91	91
S-North Sea 12	I	1	1	-	145	72	-
Skagerak 05	II	1, 2, 3	1	-	63	63	-

Research Vessel Survey Herring

Area	Season	Objectives
NW-North Sea 03 Central North Sea 09 S-North Sea 12	Feb 1978	Groundfish Survey
NW-North Sea 03 Central North Sea 09	2.Mar to 19.Mar 1978	International Young Herring Survey
Skagerak 05 Central North Sea 09	3.Apr to 17.Apr 1978	Gear Research
NW-North Sea 03 South Buchan 08 Central North Sea 09	31.July to 28.Aug 78	Groundfish Survey
Central North Sea 09	8.Aug to 18.Aug 1978	Groundfish Survey
Central North Sea 09	20.Nov to 1.Dec 1978	Groundfish Survey

Sampling Sprat

Area	Season	Type of Fish	Number of Samples		Number of Fish		
			Research Vessel	Market	Measured	Aged	Examined racially
Central North Sea 09	I	--	25	-	6804	-	-
	III	--	6	-	547	-	-
	IV	--	3	-	261	-	-

Research Vessel Survey Sprat

Area	Season	Objectives
Central North Sea 09	Feb 1978	Groundfish Survey
NW-North Sea 03 Central North Sea 09	2.Mar to 19.Mar 1978	International Young Herring Survey
Central North Sea 09	8.Aug to 18.Aug 1978	Groundfish Survey
Central North Sea 09	20.Nov to 1.Dec 1978	Groundfish Survey

Sampling Blue Whiting

Area	Season	Type of Fish	Number of Samples		Number of Fish		
			Research Vessel	Market	Measured	Aged	To be examined racially
VIb	III	2	15	-	1857	593	300
	IV	2	6	-	835	112	200
IIa	III	2	9	-	1960	176	176
	IV	2	4	-	767	240	100
IVa	I	3,4	3	-	1083	276	-
	III	2	5	-	992	177	249
Va	IV	2	15	-	5174	877	200
Vb	I	3,4	6	-	2216	493	-
	IV	2	12	-	2849	861	300
XIV	III	2	4	-	1170	289	100
	IV	2	6	-	1091	178	100

Research Vessel Survey Blue Whiting

Area	Season	Objectives
IVa Vb	10.Jan to 26.Jan 1978	Groundfish Survey (Blue Whiting)
IIb	12.June to 19.July 1978	Groundfish Survey
IIa IIb IVa Va Vb XIV	18.Aug to 22.Dec 1978 (Research trawler)	Midwater and Bottom trawling Survey for Blue Whiting and other species (in 4 legs)

Iceland

(J. Jakobsson)

Sampling HERRING

Area	Season	Type of fish	No. of samples: Research vessel	No. of samples: Fishing vessel	No. of fish: measured	No. of fish: aged	No. of fish: examined racially
S and W of ICELAND	Aug-Dec.	mixed	10	103	15082	5110	5125
S,W,N and E of ICELAND	Jan-Sept.	adults	5	13	1027	1027	1027
W and N of ICELAND	Mar-Dec.	immat.	14	5	1863	663	1393

Research Vessel Surveys

Area	Date	Objectives
SW, S, SE ICELAND	24 June-7 July	Spawning Grounds Survey
SW ICELAND	19-29 Sept.	Herring Survey
S, SE ICELAND	4-16 Oct.	Herring Survey
SE, S, SW ICELAND	23 Oct.-4 Nov.	Herring Survey
SE ICELAND	22 Nov.-18 Dec.	Abundance Estimates, Hydrography.

Sampling BLUE WHITING

Area	Season	Type of fish	No. of samples	No. of fish: measured	No. of fish: aged*
W. ICELAND	March	mixed	7	43	
"	May	"	1	100	100
"	Sept.-Oct.	mixed	5	320	320
S-SW ICELAND	April-May.	mixed	29	1895	100
"	July-Aug.	mixed	5	408	80
"	Oct.-Nov.	immat.	5	275	200
SE ICELAND	July	mixed	23	1531	
"	Oct.	adults	1	160	
E-NE ICELAND	June-Aug.	adults	14	655	491
"	Dec.	adults	1		13

* Otoliths kept for later age-reading.

Research Vessel Surveys

Area	Date	Objectives.
E. ICELAND	30 May-16 June	Blue Whiting Survey
Icelandic waters	22 May-16 June	Environmental and pelagic fish survey
E. ICELAND	16 July-11 August	Experimental fishing

Sampling CAPELIN

Area	Season	Type of fish	No. of samples Research and fishing vessels	No. of fish Measured	Aged	Examined racially
N,E,SE. ICELAND	Jan.-Mar.	Adults	51	4978	4978	380
N. ICELAND	March	Adults	5	500	500	
N. NW. ICELAND	July-Aug.	Adults	17	1650	1650	
JAN MAYEN	Sept.	Adults	3	300	300	100
N, NW. ICELAND	Oct.-Dec.	Adults	18	1800	1800	
ICELAND - E-GREENLAND.	Aug.	0-gr.	54	2062		

TAGGING

Area	Season	Type of tags	No. tagged	Type of fish	Recoveries
N of Iceland	July-Aug.	Internal	11750	adults	219
W of Jan Mayen	Sept.	Internal	5114	adults	10
NW of Iceland	Oct.	Internal	1441	adults	44

Reasearch Vessel Surveys

Area	Date	Objectives
W, N, E. ICELAND	2-20 Jan.	Capelin Survey
E. ICELAND	25 Jan-7 Feb.	Capelin Survey
W, N, E. ICELAND	25 Jan.-15 Feb.	Capelin Survey
E, SE. ICELAND	13-28 Feb.	Capelin Survey
W, N, E, S. ICELAND	6-22 March	Capelin Survey
W, N. ICELAND	29 March-19 April	Capelin Survey
W, N. ICELAND	12-30 July	Capelin Survey
W, N, E. ICELAND	9-31 Aug.	0-group Capelin and other species
W, N. ICELAND	8-30 Sept.	Capelin Survey
W. ICELAND	16-30 Oct.	Capelin Survey and Abundance Estimates
W. ICELAND	7-18 Nov.	Capelin Survey.

Sampling SANDEEL (A. marinus)

Area	Season	Type of fish	No. of samples Research and fishing vessels	No. of fish measured	aged	examined racially
SE of ICELAND	June-Aug.	adults	9	450	450	450
W and N of ICELAND	August	mixed	6	291	291	291
W and N of ICELAND	Nov.	adulst	3	120	120	120

Summary

Ireland

J Molloy

Area	Season	Type of fish	No. of samples (Market)	No. of fish measured	No. of fish aged	No. of fish examined racially
					Species	Herring
Div. VIa	I,II,IV,V,VII, VIII, XI,XII	Adult	15	3225	718	718
Div. VII,b-c	I,II,III,IV,V,VI VII,VIII,IX,X,XI	Adult	22	6931	1100	1100
Div. VII,g-k	III,V,VIII,IX,X, XI	Adult	7	865	298	298
Div. VII,a	VIII,IX,X,XI,I, V,X,XI,XII	Adult Juvenile	12 7	4946 373	570 -	570 75
Celtic Sea	I,V,VIII,X,XI, XII	Adult	17	3482	928	928
					Species	Mackerel
Div. VIa	VI,VII,X,XI	Adult	6	1627	425	-
Div. VII,b-c	V,VII,XI	Adult	4	467	238	-
Div. VII,g-k	IV,V,VI,VII,IX X,XI	Adult	16	2222	674	-
					Species	Sprats
Div. VII,g-k	I,II,V,XI,XII	Adult	18	1257	339	-
Div. VII,a	I,V,VI,X,XI,XII	Adult + Juvenile	8	1070	114	-

Research Vessel Surveys

Area	Time	Objective
Celtic Sea	February-May	Egg and larval survey to obtain estimates of abundance of sprat population.
Celtic Sea	October-February	Larval survey to obtain estimate of abundance of herring population.

Other research activities

Fecundity studies were carried out on autumn and winter spawning herring belonging to the Celtic Sea stock.

NETHERLANDS

(A. Corten)

Sampling HERRING

Area	Quarter of year	Type of fish	No. of samples		No. of fish		
			research vessel	market	measured	aged	examined racially
01 Hebrides	2	adults	-	2	225	100	50
" "	3	"	-	2	225	100	50
02 West of Shetland	2	"	-	2	247	100	50
" " " "	3	"	2	4	467	300	150
" " " "	4	"	-	2	278	100	50
03 N.W. North Sea	2	"	-	1	98	50	-
04 N.E. North Sea	2	"	-	1	86	50	-
06 N.W. of Ireland	3	"	2	2	491	200	100
08 South Buchan	3	"	1	-	135	50	-
10 West of Ireland	3	"	1	1	173	99	50
12 Southern North Sea	4	"	1	-	113	50	-
13 South of Ireland	2	"	-	5	681	250	-
" " " "	3	"	-	3	311	150	-
" " " "	4	"	-	1	110	50	-
14 Bristol Channel	1	"	-	1	133	50	-
" " "	2	"	-	1	136	50	-
" " "	3	"	-	1	91	50	-
Total			7	29			

Sampling MACKEREL

Area	Quarter of year	Type of fish	No. of samples		No. of fish	
			research vessel	market	measured	aged
IVa Northern North Sea	1	adult	-	1	21	-
" " "	2	"	-	6	298	92
" " "	3	"	-	4	188	50
" " "	4	"	-	5	225	50
Vb Central North Sea	2	"	-	8	286	50
" " "	3	"	-	19	801	100
" " "	4	"	-	10	449	50
IVc Southern North Sea	1	"	-	1	30	-
" " "	2	"	-	19	843	100
" " "	3	"	-	15	739	98
" " "	4	"	-	16	699	100
VIa N.W. of Ireland	2	"	-	2	121	50
" " "	3	"	-	5	295	100
VII South Ireland	1	"	-	13	2.040	350
" " "	2	"	-	14	2.093	350
" " "	3	"	-	16	1.283	350
" " "	4	"	-	24	3.016	550

Research vessel surveys

Area	Dates	Objectives
IVc + VIId Southern North Sea	02/01 - 06/01	ICES herring larval survey
IVc " " "	09/01 - 10/01	IKMT survey herring larvae
IVa, b, c North Sea	30/01 - 03/03	ICES Young Fish Survey
IVc Southern North Sea	20/03 - 21/04	Monitoring influx O-group herring
IVa Northern North Sea	23/08 - 31/08	ICES herring larval survey
" " " "	23/08 - 01/09	" " " "
" " " "	04/09 - 15/09	" " " "
IVb Central North Sea	20/09 - 27/09	" " " "
" " " "	02/10 - 11/10	" " " "
IVc + VIId Southern North Sea	11/12 - 22/12	" " " "

NORWAY

(I.Røttingen, O.Dahl)

SAMPLING

HERRING

Area		Season	Type of fish	No.of samples		No.of fish measured	No.of fish aged	No.of fish examined racially
Code No	Name			Research vessel	Market			
00	Lofoten	1	Mixed	1		82	74	
05	Helgaland-Troms	1	-"-	5		418	409	
06	Trøndelag	1	-"-	6		447	437	
07	Møre-Trøndelag	1	-"-	5		500	490	
28	W-Norway	1	-"-	3		133	131	
39	N of Lofoten	1	Juv.	1		1	1	
05	Helgeland-Troms	2	Mixed	1		100	100	
06	Trøndelag-Helgeland	2	-"-	7		391	354	
07	Møre-Trøndelag	2	-"-	2		191	191	
11	Goosebank	2	-"-		2	86	86	
00	Lofoten	3	-"-	4		149	149	
04	Troms-W-Finnmark	3	0-group	2		37	36	
05	Helgeland-Troms	3	Mixed	2		32	31	
12	W-Barents Sea	3	0-group	3		19	19	
20	Bear Island	3	-"-	2		14	13	
27	E-Norwegian Sea	3	-"-	1		1	1	
39	- " -	3	-"-	3		9	3	
00	Lofoten	4	Mixed		18	210		
04	Troms-W-Finnmark	4	-"-	14		1313	400	
05	Helgeland-Troms	4	-"-	16		1352	319	
06	Trøndelag-Helgeland	4	-"-	13		968	489	
07	Møre-Trøndelag	4	-"-	22		1548	1162	

TAGGING HERRING

Area Code No.	Name	Season	Type of tags	No.Tagged	Type of fish	Recoveries
07-06-05-04	Stad-Troms	02	Internal	40996	juv/adult/spawn	68

RESEARCH VESSEL SURVEYS HERRING

Area	Date	Objectives
Stad/Troms	16 January - 15 March	Spawning migration, Experimental fishing
-"-	29 March-15 April	Distribution of post spawners and herring larvae
-"-	15 April-30 April	Distribution of larvae
-"-	15 April-15 May	Tagging
Barents Sea/ Norwegian Sea +)	15 August-15 September	O-group survey
Stad/Finnmark	2 October-18 November	Distribution, experimental fishing
-"-	1 November-14 December	O-group distribution and abundance

+) Two vessels

SAMPLING

CAPELIN

Area		Season	Type of Fish	No. of Samples		No. of Fish measured	No. of Fish aged	No. of Fish examined racially
Code No.	Name			Research vessel	Market			
01	Barents Sea	1	Mixed		84	8680		
02	-"-	1	-"-		4	411		
03	-"-	1	-"-	2	1208	125878	240	
04	W. of Troms	1	-"-		2	203		
10	Barents Sea	1	-"-	14	264	28849	427	
11	-"-	1	-"-	5	113	12085	154	
12	-"-	1	-"-	3	8	1053	199	
13	-"-	1	-"-	26	402	44791	1620	
14	-"-	1	-"-	9	52	6050	559	
15	-"-	1	-"-	8	1	900	387	
16	-"-	1	-"-		2	205		
20	-"-	1	-"-	9		900	792	
01	-"-	2	-"-	3		200	71	
02	-"-	2	-"-	4		285	109	
03	-"-	2	-"-	5	167	17787	526	
04	W. of Troms	2	-"-	1		100	34	
10	Barents Sea	2	-"-	5	2	417	168	
11	-"-	2	-"-	1		7	7	

SAMPLING

CAPELIN

Area		Season	Type of Fish	No. of Samples		No. of Fish measured	No. of Fish aged	No. of Fish examined racially
Code No.	Name			Research vessel	Market			
12	Barents Sea	2	Mixed	5		500	492	
13	-"-	2	-"-	1	36	4034	8	
14	-"-	2	-"-	1		3	3	
01	-"-	3	-"-	4		593	10	
02	-"-	3	-"-	1		127		
03	-"-	3	-"-	20		1563	128	
04	W. of Troms	3	-"-	2		12		
05	W. of Lofoten	3	-"-	3		9	8	
10	Barents Sea	3	-"-	4		529	50	
11	-"-	3	-"-	12		1468	20	
12	-"-	3	-"-	14		940	408	
13	-"-	3	-"-	22		2092	504	
14	-"-	3	-"-	5		361	35	
15	-"-	3	-"-	14	10	2357	567	
16	-"-	3	-"-	3	125	13628	105	
17	-"-	3	-"-	1	1	208	49	
20	-"-	3	-"-	24		1892	1206	

SAMPLING

CAPELIN

Area		Season	Type of Fish	No. of Samples		No. of Fish measured	No. of Fish aged	No. of Fish examined racially
Code No.	Name			Research vessel	Market			
21	W. of Spitsbergen	3	Mixed	2		2	2	
22	-"-	3	-"-	3		38		
23	-"-	3	-"-	12	168	19175	728	
24	-"-	3	-"-	18	2	2010	844	
25	-"-	3	-"-	2		2	2	
27	Sea of Norway	3	-"-	1		1		
03	Barents Sea	4	-"-	1		48	10	
04	W. of Troms	4	-"-	4	2	467	147	
15	Barents Sea	4	-"-		13	1515		
16	-"-	4	-"-	8		651	259	
17	-"-	4	-"-	7		735	233	
21	W. of Spitsbergen	4	-"-		1	103		
23	-"-	4	-"-		340	35310		
24	-"-	4	-"-		49	5224		

SAMPLING

CAPELIN

Area		Season	Type of Fish	No. of Samples		No. of Fish measured	No. of Fish aged	No. of Fish examined racially
Code No.	Name			Research vessel	Market			
35	Jan Mayen	3	Mixed		1	110		
38	-"-	3	-"-		229	24106	140	
62	-"-	3	-"-		35	3573	200	
?	-"-	3	-"-		2	155	149	
35	-"-	4	-"-		1	104		
38	-"-	4	-"-		2	204		
62	-"-	4	-"-		2	201		

RESEARCH VESSEL SURVEYS — CAPELIN

Area	Date	Objectives
Barents Sea	6 - 28 Jan. +)	Distribution of capelin.
Barents Sea	30 Jan. - 15 March	Distribution of capelin.
Finnmark coast	10 - 22 April	Distribution of spawning grounds for capelin.
Barents Sea	14 June - 18 July	Distribution of capelin larvae. Quantity and distribution of older capelin.
Barents Sea	9 Aug. - 14 Sept.	0-group survey.
Barents Sea	14 Sept. - 11 Oct. +)	Quantity and distribution of capelin.

+) Two vessels

TAGGING

None

SAMPLING

BLUE WHITING

Area No	Area Name	Season	Type of fish	No of Samples: Research vessel	No of Samples: Market	No of fish measured	No of fish collected otoliths	No of fish aged	No of fish examined racially
05	W.of Lofoten	2	Mixed	1		25	25	25	
07	W.of Møre	2	-"-	1		6	6		
06	W.of Helgeland	2	-"-	5		201	196	196	
30	Norwegian Sea	2	-"-	2		166	166	66	
37	- " - -"-	2	-"-	1		2			
31	Faroe Island	2	-"-		1	100	100	100	
34	Norwegian Sea	2	-"-	3		135	135		
57	W.of Faroe Islands	2	-"-	1		100	100		
50	E.of Iceland	2	-"-	1		100	100		
36	Norwegian Sea	2	-"-	5		429	429		
38	- " - -"-	2	-"-	1		70	70		
39	- " - -"-	2	-"-	2		160	160		
27	- " - -"-	2	-"-	3		300	300		
12	W.of Troms	3	-"-	3		184	184		
30	Norwegian Sea	3	-"-	4		210	210		
05	W.of Lofoten	3	-"-	1		100	100		
00	Lofoten	3	-"-	2		130	130		
37	Norwegian Sea	3	-"-	2		149	149		
39	- " - -"-	3	-"-	4		319	319		
27	- " - -"-	3	-"-	8		632	632		
07	W.of Møre	3	-"-	1		10	10		
34	Norwegian Sea	3	-"-	2		113	113		
36	- " - -"-	3	-"	2		109	109		

(forts.)

SAMPLING

BLUE WHITING

Area No	Area Name	Season	Type of fish	No of Samples: Research vessel	No of Samples: Market	No of fish measured	No of fish collected otoliths	No of fish aged	No of fish examined racially
35	S.of Jan Mayen	3	Mixed	2		204	204		
38	N.of Jan Mayen	3	-"-	3		300	300		
27	Norwegian Sea	3	-"-	7		532	532		
20	Bear Island	3	-"-	1		12	12		
08	Hardangerfjord	4	-"-	1		386	100		
43	W.of Scotland	4	-"-	1		23	23		
28	W.of Sognefjord	4	-"-	1		112	112		

SAMPLING RESEARCH VESSEL SURVEYS BLUE WHITING

Area	Date	Objectives
West of British Islands/ Faroe	30 March - 9 April and 20 April - 5 May	Distribution. Spawning migration -"- - " -
Western Barents Sea	17 April - 11 May	Distribution
Norwegian Sea/ Faroe-Bear Island	29 May - 29 June	Distribution
Norwegian Sea/ Jan Mayen to Spitsbergen	10 July - 10 August	Distribution/Fishing experiments
Norwegian Sea/ Møre-Jan Mayen-Spitsbergen	7 - 20 August	Distribution
North Sea	1 November - 15 December	Distribution

NORWAY

Mackerel (Scomber scombrus)

Sampling

Area	Season	Type of fish	No. of samples		No. of fish		examined racially
			Res. vessel	market[x]	measured[xx]	aged	
SW of Ireland	May	adult	1		381	381	
NE North Sea	May/July	"		5	499	499	
Skagerrak	May/Aug.	"		4	571	371	
E N. Sea, Skag.	July/Aug.	"	6		600	600	
N. North Sea	July/Oct.	"		12	1 212	1 212	
S. North Sea	Aug.	"	1		50	50	
N. North Sea	July/Oct.	"		675	28 708		
NW of Hebrides	November	"		1	91	91	

x) Samples obtained from fish co-operatives and meal and oil factories

xx) In addition: all tagged fish are measured

With regard to "research vessel surveys" for the species: mackerel, herring and sprat data are given in one table, and in the same way we have handled those species which have been used for tagging experiments: mackerel, dogfish, (sprat).

Bluefin tuna (Thunnus thynnus L.)

The total catch of bluefin tuna in Norwegian waters 1978 was ca. 180 tons. (In 1977 the Norwegian tuna catch was 587 tons). The tuna investigations have been limited to estimate the size composition in kilo. The result is sent to ICES Bluefin Tuna Working Group in order to be published.

Horse mackerel (Trachurus trachurus L.)

In connection with the Norwegian purse seine fishery for mackerel about 767 tons horse mackerel were caught as by-catches in the northern North

Sea. In addition 195 tons were landed by trawlers fishing off the southern Norwegian westcoast. The total catches were in 1977 440 tons and in 1976 ca. 5 300 tons. The horse mackerel was landed for fish meal and oil factories and from which our samples are obtained. - In the period August-September we obtained from N North Sea 41 samples of adult fish and of which a number of 1 358 were measured.

Dogfish (Squalus acantias L.)

Sampling

Biological data are obtained from tagging experiments; the dogfish caught by longline (sea table: tagging).

Research vessel surveys

Area	Season	Objectives
North Sea/Skagerrak	Jan/Feb.	Fish survey
North Sea	Feb./Mar	ICES Young herring survey
"	May/Jul	Egg and larval survey, mackerel
"	Jul/Aug	Fish survey
"	Oct.	Larval survey, herring
"	Nov/Dec	Fish survey
Fjords of western and northern Norway	Nov/Dec	O-gr. survey, sprat and herring
West of 4°W, ICES area VIa	Nov.	Fish survey, mackerel

Tagging

Area	Season	Type of tags	No. tagged	Type of fish	Total recoveries 1978
SW of Ireland	May	int. stell	18169	Mackerel	650
Off SW coast Norway/Skagerrak	Jul/Aug	"	12173	"	
			0	Sprat	108
West of the Orkneys	February	Petersen disc.	581	Dogfish	254
Central North Sea	September	"	3018	"	
Norw. w. coast S. of Bergen	November	"	1137	"	

Sampling data for herring

Area	Season	Type of fish	No. of samples		No. of fish measured	No. of fish aged	No. of fish exam. rac.
			Research vessel	market			
Hebrides (01)	I	adults		2	200	200	
	II	"		3	300	300	
	III	"		2	188	188	
Skagerrak (05)	I	immature	1		98	98	
	III	"		3	300	300	100
	IV	"	1		54	54	54
Central North Sea (09)	I	immature	9		742	742	

Sampling data for sprat

Area	Season	Type of fish	No. of samples		No. of fish measured	No. of fish aged
			Research vessel	market		
Central North Sea (9)	I	immature/ adults	4	74	8 146	700
	IV	"		397	41 467	800
NW North Sea (03)	III	"		1	100	-
	IV	"		10	1 054	100

POLAND

(M. Giedz)

Samplin data for Blue whiting

Area	Season quarters	No. of samples		No. of fish	
		Research vessel	Commercial trawlers x)	Measured	Aged
VII, g-k	1	-	34	11.085	1.200
VIIb	2	-	13	4.740	400
VIa	2	-	22	6.331	900
IVa	2	-	33	12.957	700
IIa	3	-	4	864	170

X) samples from exploratory fishing.

Portugal I

(I.F. Barraca)

Pendant 1978, dans l´institut Nacional d´Investigation des Pêches on a porsuivi des l´études sur les échantillons de Sardine débarquées par des bateaux commerciaux dans les côtes ouest et sud du Portugal et on a aussi déterminé l´age de quelques exemplaires mesurés bien que d´autres aspects biologiques.

Les données référentes au nombre d´échantillons, aux exemplaires mesurés et aussi à ceux dont l´âge a été determiné, sont enregistrées dans le tableau suivant:

Région	Saison	N.échantillons Marché	N. de poissons	
			Mesurés	dont âge determiné
IX	1er trimestre	54	11764	248
"	2ème trimestre	75	15166	258
"	3ème trimestre	77	17434	155
"	4ème trimestre	71	15412	238
	Totaux	277	59776	899

Portugal 2

(M. Sobral)

L´échantillonage a eu lieu pendant l´année de 1978 concernant les apports comerciaux des chalutiers, filet-tournants et artisans.

Les résultats sont présentés dans le tableau ci-joint:

Area	Saison	Type de Poisson	N° d´échantillons (marché)	N° de poissons mésurés
IX du CIEM	I trimestre	Adultes et Imatures	113	11395
	II "		120	11736
	III "		119	10810
	IV "		97	9693
		TOTAL	449	43634

SPAIN

(C. Cendrero)

Les clupéiformes

Sardine (Sardina pilchardus)

Les recherches sur la sardine se déroulent à deux régions: le NW de l'Espagne peninsulaire et les îles Canaries-NW de l'Afrique. Les études de la pêcherie peninsulaire sont dirigées vers la connaissance de l'effort de pêche et les captures des bateaux espagnols des ports au sud de Finisterre, avec des échantillonnages à deux de ces ports. À la région du nord-ouest africain, des observations sur les caractères biométriques et méristiques de la population exploitée sont aussi faites.

Échantillonnages pour la sardine

Région	Trimestre	Nbre. des échantillons		Nbre. de poissons		
		Bateau	Marché	Mesuré	Âge déterminé	Race
VIII c	1	1	9	1 426	-	-
	2	-	12	1 526	-	-
	3	-	7	561	-	-
	4	-	7	833	-	-
IX a	1	-	6	670	-	-
	2	-	27	3 322	-	-
	3	-	19	1 912	-	-
	4	-	20	2 022	-	-
XI a	1	-	14	14 881	573	-
	2	-	20	7 658	307	-
	3	-	19	11 124	478	-
	4	-	22	15 068	451	-

Anchois (Engraulis encrasicolus)

La saison de pêche à l'anchois de la flottille du nord de l'Espagne a été très courte en 1978. Elle n'a duré que deux mois, avril et mai, mais ses résultats ont été bons. Les prises ont totalisé 37 000 tonneaux. Des observations ont continué comme les années précédentes sur des échantillons récoltés à bord de bateaux de pêche et aux marchés. Une clé taille/âge a été préparée pour faire un premier essai d'analyse de cohortes. Les données usuelles de captures et d'effort de pêche ont été aussi recuillies.

Échantillonnages pour l'anchois

Région	Trimestre	Nbre. des échantillons		Nbre. de poissons		
		Bateau	Marché	Mesuré	Âge déterminé	Race
VIII b,c	2	15	4	1 767	281	-

Les thonidés

L'Institut Espagnol d'Océanographie a continué ses travaux sur le germon (Thunnus alalunga) et le thon rouge (T. thynnus) du golfe de Gascogne, tandis que le laboratoire de l'Institut pour les Recherches sur les Pêches à Cadix étude le thon rouge capturé par les madragues du sud-ouest de l'Espagne. Les résultats des travaux sur T. thynnus sont communiqués régulierement au Groupe de Travail du Thon Rouge du CIEM.

Deux campagnes de marquage de thonidés ont été éfectuées en 1978, l'une dans le golfe de Gascogne pour marquer le germon et le thon rouge, pendant laquelle 300 poissons environ fûrent marqués, et l'autre à la madrague de Ceuta (sud du détroit de Gibraltar) pour l'étude des petits thonidés de la Méditerranée et leur rapport avec les stocks du golfe ibero-marocain. Presque 600 individus de Sarda sarda, Euthynnus quadripunctatus et Auxis rochei marqués ont été le résultat de cette deuxième campagne, qui a eu lieu en octobre.

Finalement, les thonidés tropicaux continuent à être étudiés par le Laboratoire Océanographique des Îles Canaries.

Échantillonnages pour le thon rouge (golfe de Gascogne)

Région	Trimestre	Nbre. des échantillons		Nbre de poissons		
		Bateau	Marché	Mesuré	Âge déterminé	Race
VIII b,c	3	-	48	5 145	-	-

Région	Trimestre	Nbre. des échantillons		Nbre. de poissons		
		Bateau	Marché	Mesurés	Âge déterminé	Race
VIII b,c	3	-	11	10 127	-	-
	4	-	5	520	-	-
X	2	-	4	400	-	-
	3	-	5	500	-	-
	4	-	5	520	-	-

Échantillonnage pour les thonidés tropicaux

TRIMESTRE	Nombre de poissons mesurés					TOTAL
	T. thynnus	T. albacares	T. obesus	T. alalunga	K. pelamis	
I	43	——	100	129	——	272
II	105	19	198	115	590	1.027
	148	19	298	244	590	1.299

Autres espèces

Le merlan bleu (Micromesistius poutassou)

La couverture statistique des données de capture et d'effort a été augmentée à plusiers ports du NW de l'Espagne, ce qui a permis le control de presque la totalité des débarquements de l'espèce. Ces données ont été récuperées depuis 1976 et on a commencé la lecture des otolithes selon les sexes.

On a constaté une augmentation des débarquements de cette espèce, dus peut-être à la diminution des captures de pêche fraiche provenantes d'autres pêcheries, laquelle a fait croître la démande de merlan bleu. Il est possible que ces captures étaient faites depuis des années mais qu'elles ne fûrent pas débarquées à cause de la petite démande qui en existait.

En ce qui concerne la biologie d'autres espèces d'intérêt économique, l'Institut pour les Recherches sur les Pêches a fait des déterminations périodiques sur la taille l'âge, le sexe, l'état sexuel, le poids total et le poids des gonades et du foie de Scomber japonicus, Euthynnus quadripunctatus, Sarda sarda, Auxis rochei, et a commencé l'étude des mugilidés Mugil auratus, M. capito, M. cephalus, M. provensalis et M. saliens des salines de San Fernando (province de Cadix, SW de l'Espagne).

Échantillonnages pour le merlan bleu

Région	Trimestre	Nbre. des échantillons		Nbre. des poissons		
		Bateau	Marché	Mesuré	Âge déterminé	Race
VIII c et IX a	1	1	9	1 426	-	-
	2	-	12	1 526	-	-
	3	-	7	561	-	-
	4	-	7	833	-	-

Sweden

(O.Hagström & A.Lindquist)

Sampling Data Sprat

Area	Season	Type of Fish	No of Samples Research Vessel	No of Samples Market	No of Fish Measured	No of Fish Aged	No of Fish examined racially
Inner Skagerrak	I-III	Adults	-	2	945	117	-
Skagerrak	I-III	"	3	-	2321	197	-
	IV	"	1	-	610	79	-
Kattegat	I-III	"	1	5	3070	461	-
	IV-VIII	"	5	-	3256	399	-
Skagerrak - Kattegat	I-III	"		36	9003	358	-
	IV-VIII	"		41	8633	253	-
	IX-XII	"		42	10185	961	-
Baltic	IX-XII	"	13	-	5980	944	-
North Sea	II	"	2	-	1332	136	-

Research Vessel Surveys

Area	Season	Objectives
Baltic	IX, X	Acoustic surveys, echointegrations, trawling
Skagerrak, Kattegatt	IV	Acoustic surveys, echointegrations, trawling

Sampling Data for Mackerel

Nil

Area	Season	Type of fish	No of Samples		No of Fish		No of Fish
			Research vessel	Market	Measured	Aged	examined racially
Kattegat	I	Imm.ad, spawners		8	2 970	366	366
	II	" " "	8	19	6 246	539	530
	III	" " "		21	4 095	526	526
	IV	" " "	2	20	4 058	544	544
	V	"		18	3 588	392	376
	VI			1	119	12	
	VII			6	460	25	
	VIII	" "		26	4 585	347	332
	IX	" "		22	2 492	471	457
	X	" "		50	12 193	918	863
	XI	" "		14	2 723	557	518
	XII	" "		19	6 762	378	378
Skagerrak	I	Imm.ad.		3	1 047	307	307
	II	" "	7		2 687	452	452
	III	Spawners		2	294	186	186
	IV	Imm. spawners	1	2	1 073	296	296
	VI	Imm.ad, spawners		1	159	95	95
	VII	" "		1	414	108	108
	IX	" "		1	286	100	100
	X	"		1	30	30	30
	XI	" "		2	366	201	201
	XII	" "		1	182	100	100
Nordsjön	II	Imm.ad	3		253	112	112

Research Vessel Survey

Area	Season	Objectives
Kattegat, Skagerrak	II	Investigation on young herring and herring larvae.
" "	IV	Investigation on herring larvae. Echointegrations.

England and Wales: A. C. Burd

1. Sampling

HERRING

Area	No. of samples		No. of fish		
	Research vessel	Market samples	Measured	Aged	Racial invest.
N. North Sea 104A	+	-	320	320	-
M. " " 104B	+	1	1 200	950	300
S. " " 104C		9	2 381	1 407	400
Irish Sea 107A		26			

In addition 214 herring were tagged in the S. North Sea (104C).

SPRAT

Area	No. of samples		No. of fish	
	Research vessel	Market samples	Measured	Aged
M. North Sea 104B	15	84	16 384	586
W. English Channel 107E		4	942	90

Note: Mackerel reported to Pelagic Southern Committee.

2. Research vessel surveys

Area	Month	Objectives
Irish & Celtic Seas	January	Herring larvae and 0-group survey
North Sea	January-February	Sprat survey
" "	February-March	International young fish survey
" "	July-August	0-group herring
" "	September-October	Herring larvae survey
" "	November	Blackwater herring

1. Sampling

MACKEREL

Area	No. of samples		No. of fish	
	Research vessel	Market samples	Measured	Aged
W. English Channel 107E	1	215	24489	1 914

2. Research vessel surveys

Area	Month	Objective
W. English Channel	December	Acoustic abundance estimates of pelagic fish

SCOTLAND

(R.S. Bailey)

HERRING SAMPLING

Area	Season	Type of Herring	No of Samples		No of Fish		
			Research Vessel	Market	Measured	Aged	Examined racially
IVa Northern North Sea							
West of Shetland (02)	Jan-Mar	Adult	2		14	14	
	"	"		7	1404	510	100
	Apr-Jun	"		2	239	239	239
	Jul-Sept	"		2	349	315	165
	Oct-Dec	"	3		348	172	172
NW North Sea (03)	Jan-Mar	imm/adult	34		3561	109	
	Jul-Sept	Immature	5		261		
	"	Adult		2	444	444	444
	Oct-Dec	imm/adult	33		2376	531	405
	"	Adult		6	958	677	625
NE North Sea (04)	Oct-Dec	imm/adult	3		4		
IVb Central North Sea							
South Buchan (08)	Jan-Mar	imm/adult	11		47	47	
	Jul-Sept	Immature	4		502	17	
	Oct-Dec	imm/adult	6		60		
Central North Sea (09)	Jan-Mar	Immature	23		2607	304	
	Jul-Sept	imm/adult	8		1851	453	200
VIa West of Britain							
Hebrides (01)	Oct-Dec	Adult	4		127	100	100
N W Ireland (06)	Oct-Dec	Adult	4		272	221	221
West of Scotland (07)	Jan-Mar	imm/adult	30		4309	1393	974
	"	Adult		85	14924	3125	2019
	Apr-Jun	imm/adult	9		726	332	232
	"	Adult		98	12164	4185	1387
	Jul-Sept	imm/adult	15		976		
	"	Adult		23	2715	2180	
	Oct-Dec	Adult	4		7		
	"	Adult		60	9719	2880	2116

Tagging

Area	Season	Type of Tag	No Tagged	Type of Fish	Recoveries
Minch	November	Scottish combination	858	9 Adult	0
"	"	Flag	1071	"	0
"	"	Spaghetti	1120	"	0

Research Vessel Surveys

Area	Season	Objectives
North Sea	February	International Young Herring Survey
Clyde	February–April	Trawling and larval survey of spawning ground
North Sea	July–August	Acoustic and trawling survey
Clyde	July–August	Midwater Trawling survey
West coast and north coast of Ireland	August–October	Larval surveys
North Sea	September–October	Larval surveys
West coast	August–September	0-group survey
North Sea	November–December	Late larval survey

Other Research Activities

Experimental studies continued on the development, growth and survival of herring eggs and larvae in water varying in the intensity of contamination by industrial pollutants.

Immature and mature herring from the Firth of Clyde and the northern Irish Sea were examined for tag parasites which might help to clarify the stock situation in these areas. Numbers of pyloric caeca were also counted. Examinations of adult Minch herring were continued on a regular basis in order to obtain estimates of the proportions of recruitment from Blöden and other nursery areas to the Minch at each age.

Sprat Sampling

Area	Season	No of Samples		No of Fish	
		Research Vessel	Market	Measured	Aged
IVa Northern North Sea	Jan-Mar	5	17	4623	376
	Apr-Jun	5	0	768	0
	Jul-Sept	1	0	236	38
	Oct-Dec	3	27	5967	471
IVb Central North Sea	Jan-Mar	7	23	4314	691
	Apr-Jun	0	1	150	33
	Jul-Sept	8	0	2161	113
	Oct-Dec	0	5	1429	149
VIa West of Britain	Jan-Mar	26	4	5742	137
	Apr-Jun	4	0	998	0
	Jul-Sept	14	0	5805	72
	Oct-Dec	0	7	2090	144

Research vessel surveys

North Sea January Acoustic abundance survey

Mackerel

Sampling

Area	Season	Type of Fish	No of Samples		No of fish	
			Res. Vess.	Market	Meas	Aged
IVa Northern North Sea	Jan-Mar	Immature	7	-	165	55
	Apr-June	Adult	-	2	315	169
	July-Sept	"	-	34	3882	567
	Oct-Dec	"	-	8	818	0
IVb Central North Sea	Jan-Mar	Immature	10	-	48	42
	Apr-June	"	-	1	111	67
	July-Sept	"	-	10	1535	459
	Oct-Dec	"	-	0	0	0
IVa West of Scotland	Jan-Mar	Adult	-	5	424	379
	Apr-June	"	-	7	836	482
	July-Sept	"	11	41	6045	1489
	Oct-Dec	"	-	25	2309	912

Tagging

Area	Season	Type of Tag	No Tagged	Type of fish	Recoveries
VIa Minch	August	Externals: Spaghetti	505	Adult	1
		Flag	490	"	9
		Internals	930	"	9
		TOTAL	1925		19

Other Research Activities

Samples of 1- and 2-group mackerel from the northern North Sea, Cornwall and South Brittany were examined for potentially useful tag parasites.

Blue Whiting

Sampling

Area	Season	Type of fish	No of Samples		No of Fish	
			Research Vessel	Market	Measured	Aged
VIa West of Scotland	Apr–June	Adult/ Immature	6	2	3597	952
IVa NW Shetland	Jan–Mar	"		1	168	81
Vb Faroe	Jan–Mar	"		2	375	160
IIa Norwegian Sea	July–Sept	"	3		276	150

Research Vessel Surveys

Area	Month	Objectives
VIa/Vb West of Scotland/ Faroe	February	Acoustic survey
VIa West of Scotland	April	Midwater trawling and acoustic abundance survey
VIa/Vb West of Scotland/ Faroe	June	Acoustic survey

Other Research Activities

Histopathology studies were carried out on blue whiting with *Eimeria* infections of the liver.

U.S.A.

(Richard C. Hennemuth
Edward D. Houde)

Bluefin Tuna

The Southeast Fisheries Center (SEFC) of the National Marine Fisheries Service (NMFS) studies Atlantic bluefin tuna in order to provide scientific information on the status of stocks of the species for U.S. Commissioners of the International Commission for the Conservation of Atlantic Tunas (ICCAT) and others. Bluefin tuna research is directed at tagging, ageing, catch effort, and catch composition studies of the U.S. fisheries.

The University of Miami is conducting research in the application of remote sensing techniques to Atlantic bluefin tuna resource utilization and management. Objectives are to identify ocean fronts and their dynamics from satellite data and to relate these front characteristics to distribution, movements, availability and spawning success of bluefin tuna.

Herring

The Northeast Fisheries Center (NEFC) conducted work for stock assessment of sea herring. The results of this work serve in formulating management plans.

Specific bottom trawl surveys were conducted in the area between Georges Bank and Cape Hatteras to determine relative abundance and distribution of herring during February and March in cooperation with the FRG R/V ANTON DOHRN and the Polish R/V WIECZNO, and during October in cooperation again with the FRG R/V ANTON DOHRN.

Division personnel cooperated in a herring tagging program during September-November with the Maine Division of Marine Resources. About 10,000 herring were tagged along the coast of Maine near Boothbay Harbor and an additional 10,000 were tagged in the Jeffreys Ledge area near Gloucester, Massachusetts.

Commercial and research samples of mackerel were aged by means of otoliths.

The Northeast Fisheries Center is also conducting studies on Atlantic herring which include: herring egg predation over the last two years, herring larval patch study and larval herring predators.

Work on genetic variation and population definition in Atlantic herring is being done at the University of Maine. Objectives are to develop models of Northwest Atlantic herring populations, identify suitable

biochemical markers, confirm inheritance of biochemical markers, biochemically characterize samples of spawning herring and compare biochemical/genetic characteristics among spawning areas.

Mackerel

The Southeast Fisheries Center initiated studies on the age, growth, and food habits of king mackerel and Spanish mackerel. Over 22,000 measurements, samples and determinations were made this year of these fish.

A colloquium on mackerel was arranged and conducted in March 1978 at Brownsville, Texas, at the Gulf States Marine Fisheries Commission's 28th Annual Spring Meeting. The proceedings will be published in 1979.

The Northeast Fisheries Center conducted work for assessing stocks of Atlantic mackerel, with results serving as input to fishery management plans.

Specific bottom trawl surveys were conducted in the area between Georges Bank and Cape Hatteras to determine relative abundance and distribution of mackerel during January-March in cooperation with the USSR R/V ARGUS.

Hydroacoustic surveys were conducted to determine the hydroacoustical backscattering characteristics of mackerel during April in cooperation with the USSR R/V ARGUS.

During April-June a survey was conducted in the Middle Atlantic area (Delaware, New Jersey and New York) to determine the recreational catch of Atlantic mackerel taken by party, charter and private boats. Biological sampling was accomplished to determine the length and age composition of the catches.

Commercial and research samples of mackerel was aged by means of otoliths.

The Virginia Institute of Marine Science (VIMS) supports a survey of Atlantic mackerel sport catches in Virginia waters with objectives to obtain catch data from the recreational mackerel fishery to evaluate the mackerel sport fishery in Virginia. The survey was carried out in 1978 and will be done again in 1979.

Economic studies on the fisheries for king mackerel (*Scomberomorus cavalla*) are being conducted at the University of Florida. Objectives of the research are to estimate costs, returns and economic status of the fisheries.

Yield models for king mackerel (*Scomberomorus carvalla*) and Spanish mackerel (*S. maculatus*) fisheries in the Gulf of Mexico with objectives to

determine maximum sustainable yields, and also yield-per-recruit relationships in these fisheries. The project is being developed at the Texas A & M University.

Menhaden

The Southeast Fisheries Center continues research on Gulf and Atlantic menhaden. A summary paper was published on age, size and catch in the Gulf menhaden fishery since the initiation of the Gulf research program in 1964. Initial estimates have been developed for man-induced and natural mortality rates of the Gulf menhaden and fishery exploitation rates. Recruitment patterns of juvenile menhaden into the Gulf fishery have been determined from results of the juvenile tagging work underway since 1971. A fecundity study was completed on Gulf menhaden, paving the way for development of a spawner-recruit relationship necessary for evaluating the impact of the fishery on the Gulf stock.

A fecundity and spawning distribution study was initiated for Atlantic menhaden to identify changes which may have occurred in the population with reductions in stock size. A yield-per-recruit model for Atlantic menhaden was updated by specific fishing area to reflect current distribution of the fishing fleet. A population-predictor model was developed for Atlantic menhaden to evaluate changes in population size and fishing mortality since the initiation of the Atlantic research program in 1955.

Data for the 1978 menhaden fishery is being analyzed and summarized at the Virginia Institute of Marine Studies.

The University of Rhode Island (URI) is conducting research in interactions between menhaden (*Brevoortia tyrannus*), a filter-feeding planktivore and the plankton populations of Narragansett Bay. Recent research has been centered on developing energy budgets for menhaden, measurement of their growth rates, their abundance and movements in Narragansett Bay. In addition, phytoplankton and zooplankton biomass and production rates are being estimated.

Billfish

The Southeast Fisheries Center studies billfishes for the purpose of providing information on the status of stocks of this species for U.S. Commissioners of the International Commission for the Conservation of Atlantic Tunas (ICCAT) and others.

Research efforts for billfishes (sailfish, white and blue marlin, spearfish and swordfish) center around sampling and tagging at more than 50 billfish and gamefish tournaments each year. Foreign and domestic catch and effort data are also gathered to produce a status of stocks report.

A major mail and telephone survey was conducted this year to determine the magnitude of the recreational billfish catch from May 1, 1977 through April 30, 1978. Final results will be published early in 1979.

Acoustic tracking of broadbill swordfish is being done at the Woods Hole Oceanographic Institution (WHOI). Objectives are to investigate thermal physiology and to relate activity of the fishes to light, water temperature and other environmental parameters.

Scientists at the University of Miami are conducting work to determine age and growth rates, to describe the developing fishery, to determine catch and effort and to investigate the biology of swordfish.

Butterfish

Stock assessment on butterfish was carried out by the Northeast Fisheries Center. Results of the assessment are used in management plans.

Shark

Scientists at the Virginia Institute of Marine Science are investigating the potential for sharks in the Chesapeake Bight. Objectives are to determine long-line catch rates and to investigate the biology of dominant shark species.

Scientists at the University of West Florida are conducting research to determine catch rates, catch and effort in a recreational fishery for sharks in the Gulf of Mexico.

Principal efforts in the NEFC Apex Predator Investigation are directed to studying the migrations, distribution, age, growth, food and reproductive habits of large oceanic fishes with special emphasis on several species of large sharks. In 1978, 4,504 sharks representing 30 species were tagged and released under the NMFS Cooperative Shark Tagging Program. Volunteer fishermen accounted for about 90% of all released which also included 53 swordfish and 51 miscellaneous teleosts. During the same period, 216 fish were recaptured from 14 species of sharks.

Research cruises in 1978 were conducted by staff biologists aboard the Polish vessel R/V WIECZNO and the R/V GERONOMO from the St. Georges School in Newport, Rhode Island. Cruises ranged from Georges Bank to Cape Canaveral, Florida. Activities included longlining for longline and trawl nets in a 25 square mile study area south of Montauk, New York; and remote tracking experiments on mako sharks and swordfish using sonic tags. The sonic tracking experiments were in cooperation with Dr. Frank Carey of Woods Hole Oceanographic Institution, a world expert on underwater telemetry.

Studies of food, feeding behavior, and predator-prey relationships of sharks in the western North Atlantic were continued. The objectives of these studies are to determine the major prey species and amounts of each consumed and to understand how the distribution and abundance of sharks might be influenced by changes in the availability of important prey species on a seasonal and areal basis. In addition, attempts are being made to determine: rates of digestion, feeding periodicity and selectivity; and what impact large sharks might have on the biomass of major prey species along the northeast coast.

Sand Lance

The food habits of sand lance collected on Stellwagen Bank were described in a paper on the biology of sand lance by Meyer, Cooper and Langton of the Northeast Fisheries Center. It was submitted as an ICES document and is now in press in the Fishery Bulletin.

Pelagic Fish Research on Pacific Coast of U.S.

The Coastal Fisheries Resources Division at the Southwest Fisheries Center's (SWFC) La Jolla Laboratory is primarily involved in the study of specific problems which affect the survival/mortality of the larvae of coastal pelagic and recreational fishes for use in the construction of stock and recruitment models as the basis of fisheries management recommendations for industry, State and Federal bodies.

As part of a continual effort to upgrade and evaluate current techniques, a new method of biomass estimation was devised in 1978 which promises to alleviate much of the cost of providing an annual anchovy biomass estimate. This new technique involves sampling of anchovy eggs only, on fewer cruises, and comparing the distribution and catch of eggs with the histological state of the gonads of female anchovy.

One of the techniques which has permitted determination of the growth and survival of larval fish in the sea has been developed in the Coastal Division. Fishery biologists here have shown that fish larvae can be aged by counting the dialy rings on their otoliths.

A significant contribution to the resolution of the stock and recruitment problem was the development of an acoustic resonance frequency sonar technique for determining the size of individual pelagic fish in schools.

Careful and continual assessment of environmental conditions during the anchovy spawning season have indicated that stability of the ocean's upper mixed layer is a major criterion for success of larval feeding because it allows larval fish food to aggregate and provide enough nourishment to the larvae. The data and correlations made during the past four years culminated in 1978 in a testable hypothesis on the effect of climate and weather on the prediction of anchovy year-class strength.

The importance of frontal systems, particularly in concentrating forage for albacore, was studies and analyzed and the criteria for albacore availability based on these fronts was published in 1978.

Predator-prey relationships and other facets of life history that determine community structure have been found to be strongly influenced by environmental changes. Current studies at the Southwest Fisheries Center's Tiburon Laboratory demonstrate that seasonal patterns of coastal upwelling in northern California shape the lives of many nearshore recreational fishes and ecologically-related species.

At the Center's Pacific Environmental Group, procedures have been developed to use surface maritime data to define atmospheric effects on the ocean environment on smaller space scales than possible heretofore. This has enabled description of critical environmental processes on scales approaching those on which they may actually affect fishery stocks. This approach has been useful in generating testable hypotheses of environmental-fishery interactions.

Pelagic Fish in General

The Food Habits Project at the Northeast Fisheries Center has been involved in efforts to describe the food habits and food requirements of Northwest Atlantic fishes.

Abundance and dynamics of ichthyoplankton is being studied at the University of Maine along with ichthyoplankton studies with various objectives including basic ecological relationship age and growth, and effects of power plant operations. Species involved include Atlantic herring, rock gennel (*Pholis gunnellus*), smooth flounder (*Lyopsetta putnami*), smelt (*Osmerus mordax*) and others.

The Virginia Institute of Marine Science is conducting studies concerning some aspects of the distribution of the meso- and bathypelagic fishes over the continental slope in the Norfolk Canyon region with objectives to relate environmental factors and food habits of the fishes to their observed distributions; and surface and subsurface ichthyoplankton collections along the continental shelf and slope off New Jersey and Virginia with objectives to describe the composition, seasonality, distribution and diet variation of pelagic fish eggs and larvae.

(4/3/79)

U.S.S.R.

(A. Bogdanov)

In I978 the specialists of PINRO laboratory of pelagic fishes continued to investigate the biology of herring in the Norwegian and Barents Seas, polar cod and capelin in the Barents Sea, capelin in the areas off the Grand Newfoundland Bank and South Labrador, blue whiting in the Norwegian Sea (for sampling data see the enclosed tables).

On the basis of analysis of age-length composition of stocks, results of observations on distribution, trawl, acoustic and photogrammetric surveys data, obtained during the cruises of research vessels "Academic Knipovich", "Fridtjof Nansen", "Gemma", "Poisk", "Persey-III" condition of fish stocks, distribution peculiarities, conditions and factors favouring the formation of commercial concentrations were studied.

In June I978 complex oceanographic survey in the Norwegian and Greenland Seas was conducted by the specialists of the laboratory in cooperation with the Icelandic colleagues in August-September the O-group survey in the Barents and eastern Norwegian Seas were undertaken jointly with the scientists of Norway. An assessment of the Barents Sea capelin stock was made in cooperation with the Norwegian scientists in the second half of September-the beginning of October.

In I978 AtlantNIRO studied the abundance dynamics and stock state of pelagic fishes in the North and Norwegian Seas. The data were collected on the environmental conditions and biology of mackerel in the North Sea (3200 fishes were measured, I300 were aged in May-June, subdivision IVA) and blue whiting in the Norwegian Sea (58600 fishes were measured, I530 were aged in May-October, subdivisions Vb, IIa). The composition of commercial catches was studied.

In I979 all investigations will be continued.

In 1978 8 cruises were made to different areas of the Central-East Atlantic.

The trawling surveys on abundance were conducted in order to establish the state of raw-material resources in the Central-East Atlantic. In addition, oceanographical investigations were made and data collected for biological studies of the major fish species.

A total of 890 haulings was made and 1 160 hydrological stations occupied.

The data on the major fish species are as follows:

Species	Massive measurements	Biological analysis	Age samples
Trachurus trachurus	19 050	7 141	658
Scomber colias	7 711	100	300
Trachurus trecae	12 383	1 509	100
Caranx rhonchus	686	118	-
Sardina pilchardus	2 807	1014	500
Sardinella aurita	542	100	-
Others	6 776	255	150

The abundance and biomass of 6 fish species were estimated.

The results of the investigation indicated that in the Central-East Atlantic the pelagic fishes constituted about 95% in abundance and 90% in biomass. Trachurus trachurus, T.trecae, S. pilchardus, Sardinella aurita, S. eba, etc. were predominant pelagic fishes.

SAMPLING DATA, (CAPELIN)

Area	Season month	Type of fish	No. of Samples: Research vessel	No. of Samples: Market	No. of Fish: Measured	No. of Fish: Aged	No. of Fish: Examined racially
1	2	3	4	5	6	7	8
	I	adult	I		3475	I00	
	II	pre-spawner	4		7634	400	
	III	- " -	I3		I9929	I226	
	Σ		I8		3I038	I726	
	IУ	spawner	I0		I253I	924	
I	У	adult	I		696	I00	
	УI	- " -			735		
	Σ		II		I3962	I024	
	УII	adult	I		550	50	
	УIII	- " -					
	IX	- " -					
	Σ		I		550	50	
	Total:		30		45550	2800	
	I	adult			-		
	II	pre-spawner			I6I		
	III	-"-	I		I4I8	I00	
	Σ		I		I579	I00	
	IУ	spawner			I207		
II	У	adult			93		
	УI	- " -	2		2522	200	
	Σ		2		3822	200	
	УII	adult	I		6I38	I00	
	УIII	- " -	I2		I6994	I200	
	IX	- " -	I3		I7439	I250	
	Σ		26		40571	2550	

1	2	3	4	5	6	7	8
	X	- " -	4		603I	400	
IV	XI	- " -	I		5764	I00	
	XII	- " -			I626		
	Σ		5		I342I	500	
Total :			34		59393	3350	
I	III	pre-spawner	I		625	I00	
	Σ		I		625	I00	
IIa							
II	IУ	spawner			287		
	У	adult					
	УI	-"-	I		379	I00	
	Σ		I		666	I00	
Total:			2		I29I	200	

SAMPLING DATA, (POLAR COD)

Area	Season month		Type of fish	No. of Samples		No. of Fish		
				Research vessel	Market	Measured	Aged	Examined racially
	I	I	spawner			3569		
		II	adult			521		
		III	-"-	2		1332	200	
		Σ		2		5422	200	
		IV	adult	2		806	200	
	II	V	-"-	5		3663	500	
		VI	-"-			3097		
		Σ						
I				7		7566	700	
		VII	adult	6		1848	394	
	III	VIII	-"-	3		1104	250	
		IX						
		Σ		9		2952	644	
		X	pre-spawner	1		1822	100	
	IV	XI	-"-	4		5189	400	
		XII	spawner					
		Σ		5		7011	500	
	Total:			23		22951	2044	
		V	adult			152		
	II	VI	-"-			594		
		Σ				746		
		VII	adult	3		4939	150	
	III	VIII	-"-	7		2207	550	
IIв		IX	-"-	1		301	43	
		Σ		11		7447	743	
		X	pre-spawner	1		6284	100	
	IV	XI	-"-			2398		
		XII	spawner	1		8682	100	
		Σ						
	Total :			12		13075	943	

SAMPLING DATA, (BLUE WHITING)

Area	Season month		Type of fish	No.of Samples: Research vessel	No.of Samples: Market	No.of Fish: Measured	No.of Fish: Aged	No.of Fish: Examined racially
I	II	VI	adult			I		
	III	VII	-"-			2		
	Total					3		
		VII	-"-	I		I304	I00	
	III	IX	-"-	I		643	I00	
		Σ		2		I947	200	
IIв	IV	X	-"-	2		55I2	200	
		XI				I5		
		Σ		2		5527	200	
	Total			4		7474	400	
	II	V	-"-			I535		
		VI	-"-	2		386	I00	
		Σ		2		I92I	I00	
		VII	-"-	2		I2348	200	
	III	VIII	-"-	4		-	400	
IIa		Σ		6		I2348	600	
		X	-"-			932		
	IV	XI	-"-			2596		
		XII	-"-	I		2004	I00	
		Σ		I		5532	I00	
	Total			9		I980I	800	
		V	adult			3200		
IVa′	II	VI	-"-			4898		
	Total					8098		
Vв	II	VI	-"-	I		7595	50	
VIIв,c	II	V	-"-			342		
VII,g,h,j,k	II	V	-"-			830		

SAMPLING DATA, HERRING.

Area	Season month		Type of fish	No.of Samples		No. of Fish		
				Research vessel	Market	Measured	Aged	Examined racially
		I	adult	-		482		
	I	II	-"-	2		6465	I25	
		III	-"-	8		II765	625	
		Σ		I0		I87I2	750	
		IУ	-"-	24		9I28	2I52	
I	II	У	-"-	6		5023	600	
		УI	-"-			5560		
		Σ		30		I97II	2752	
		УII	-"-	I2		I6I	I93	
few-vertebrae herring	III	УIII	-"-	5		I6835	500	
		IX	-"-			2585		
		Σ		I7		I958I	693	
	-	X	-"-	8		I668	534	
	IУ	XI	-"-	I		8536	I00	
		XII	-"-					
		Σ		9		I0204	634	
Total:				66		68208	4829	
	I	III	-"-			54		
I		IУ	-"-	I		976	I00	
many-vertebrae h.	II	У	-"-			58		
		УI	-"-			6		
		Σ		I		I040	I00	
Total:				I		I094	I00	